

WHEELBARROW

CLAIM OF PRIORITY

[0001] This application claims priority from the provisional application entitled

5 "wheelbarrow"; Claudio Carosi, inventor; filed 8 August 2003.

FIELD OF THE INVENTION

[0002] The present invention relates generally to wheelbarrows.

[0003] In particular, the present invention relates to a self-loading wheelbarrow designed to be operable by one operator.

10 BACKGROUND OF THE INVENTION

[0004] A traditional wheelbarrow comprises a tray, two wheels and two handles extending rearwardly. It requires two operators to operate this kind of traditional wheelbarrow. A first operator wheels an empty wheelbarrow to a loading area and holds the wheelbarrow by the handles in a steady position while a second operator fills the tray of the wheelbarrow with materials such as stones, sand, soil, or the like, by using a shovel. After the tray is fully loaded, the first operator wheels the loaded wheelbarrow to a dumping area to dump the load. This kind of wheelbarrow loading operation, requiring two operators, is labour consuming and ineffective.

SUMMARY OF THE INVENTION

20 [0005] According to one aspect of the present invention, there is provided a self-loading wheelbarrow configured to be operable by one operator comprising a body having opposite sidewalls, a wheel system attached to said body for wheeling the wheelbarrow; a front loading sloping end extending forwardly of the wheel system; a rear receptacle end; a pair of laterally spaced handles attached to the body, and a

fulcrum mechanism pivotably connected to said wheelbarrow and moveable between a retracted position where the fulcrum mechanism is clearing the ground to permit wheeling of the wheelbarrow, and an operative position where the fulcrum mechanism is in engagement with the ground below the wheel system and acts as a fulcrum while force is being applied to the handles to swing the front loading sloping shovel end of the body to shovel up a load from a pile of material.

[0006] According to another aspect of the present invention, there is provided a self-loading wheelbarrow wherein the fulcrum mechanism comprises a fulcrum member pivotably connected to the body between the front loading sloping shovel end thereof, and the rear end, a free end of said fulcrum member being configured to engage to the ground at a level below the wheel system; a first link member pivotably connected to each side wall of the body adjacent the rear receptacle end thereof; a second link member pivotably connecting between the fulcrum member and the first link member; and a cross bar transversely extending behind the body and underneath the handles, each end of the cross bar being secured to the first link member at each opposite side of the body; whereby pushing the cross bar towards the front loading end drives the fulcrum mechanism from the retracted position to the operative position.

[0007] According to yet another aspect of the present invention, there is provided a self-loading wheelbarrow wherein a spring is operatively connected to said first link member. The springs provide the spring bias for the fulcrum mechanism. The springs also assist the operator in forcing the sloping shovel end forwardly into the pile of material for loading the material into the body.

[0008] According to a further aspect of the present invention, there is provided a self-loading wheelbarrow wherein each of the first link members comprises a first portion pivotably connected to the second link member, a second portion pivotably connected to the body, and a third portion secured to the cross bar.

5 [0009] According to a further aspect of the present invention, there is provided a self-loading wheelbarrow wherein the fulcrum members are two legs, and a stop plate is provided on each fulcrum member at the free end thereof for limiting the penetration of the free end of each fulcrum member into the ground. The stop plate is substantially perpendicular to a longitudinal axis of the fulcrum member. The free
10 end of each fulcrum member is tapered.

[0010] According to yet another aspect of the present invention, there is provided a self-loading wheelbarrow wherein the front loading sloping shovel end of the body comprises a blade portion and wherein each opposite sidewall at the front loading end of the body has a height tapering towards the blade portion.

15 [0011] The various features of novelty which characterize the invention are pointed out with more particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated and described preferred
20 embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective view of a self-loading wheelbarrow in accordance with a preferred embodiment of the present invention;

5 [0013] FIG. 2 is an illustrative diagram showing a preferred embodiment of the wheelbarrow in accordance with the present invention in a first position ready for loading, with the wheels still on the ground, and the legs retracted;

10 [0014] FIG. 3 is an illustrative diagram showing the wheelbarrow in a second, loading position, with the legs swung forward and extended and with the wheels raised above ground level; and

[0015] FIG. 4 is an illustrative diagram showing the wheelbarrow after being loaded, with the legs once more retracted and the wheels on the ground.

DETAILED DESCRIPTION OF THE INVENTION

15 [0016] FIG. 1 is a perspective view of a self-loading wheelbarrow 10 illustrating a preferred embodiment of the present invention.

Wheelbarrow 10 comprises a body 12, a wheel system in this case being two wheels 14 rotatably mounted to the body 12, and two laterally spaced handles 16.

20 [0017] The body 12 is generally in the shape of a sloping shovel having a base 18, and two sidewalls 20 and 22. The body 12 has a front loading sloping shovel end 24 and a rear receptacle end 26. The front loading sloping shovel end 24 extends forwardly of the wheel system and enables load materials such as stones, sand, soil,

or the like, to be loaded directly without shovelling. The rear receptacle end 26 is the end of the body 12 which prevents the loaded materials from sliding off the base 18.

[0018] The front loading end 24 has a sloping shovel blade portion 28 extending across substantially the width of the body 12. The front loading sloping shovel end of the body 12 has tapered sidewalls 30 tapering towards the blade portion 28.

[0019] The two wheels 14 are rotatably mounted on opposite sidewalls 20 of the body 12 respectively. Each of the two wheels 14 is rotatably mounted, such as, on an axle 32. The axle is located rearwardly of the sloping shovel end of the body so as to permit material to be shovelled up from a pile directly into the body as described below. This feature also ensures that the weight of the load will be carried principally on the wheels, with only a little weight on the hands and arms of the operator.

[0020] The two laterally spaced handles 16 extend rearwardly and are fixedly attached to the body 12 respectively. In the preferred embodiment, the handles 16 are fixedly attached to the opposite sidewalls 20 of the body 12 respectively. Each handle 16 is fastened to each sidewall 20 of the body 12 by fastening means 34 such as bolts and nuts.

[0021] A movable fulcrum leg member 36 is pivotably connected to each opposite sidewall 20 of the body 12 at the front loading end thereof by means of pivot pins 37. The free end of each fulcrum leg member 36 is provided with a tapered end 38. This tapered end 38 is configured to anchor into sand or soil on the ground. A stop plate

40 is provided at the free end of the fulcrum leg member 36 above the tapered end
38 in order to limit the penetration of the fulcrum leg member 36 into the ground.

[0022] Two first link members 42 is pivotably connected to each opposite sidewall 20
5 of the body at the rear receptacle end thereof. In accordance with a preferred
embodiment of the present invention, the first link member 42 takes the form of a
triangular plate 44. Each triangular plate 44 has a first corner 46, a second corner 48,
and a third corner 50. The first corner 46 of each triangular plate 44 is pivotably
connected to the body 12 by means of a pivot pin 52. A cross bar 54 transversely
10 extends behind the body 12 with both ends each being secured to the second corner
48 of the respective triangular plates 44. The third corner 50 of the respective
triangular plate 44 is pivotably connected to one end of a respective second link
member 56 by means of a pivot pin 58. The other end of the second link member 56
is pivotably connected towards the free end of a respective fulcrum leg member 36
15 by means of a pivot pin 60.

[0023] The fulcrum leg members 36, the first and second link members 42, 56, and
the cross bar 54 together form a fulcrum mechanism.

20 [0024] A spring 62 extends from the first link member 42 to the handle 16 on each
side of the body 12. The springs 62 are employed to bias the fulcrum mechanism to
a retracted position where the fulcrum members 36 are out of contact from the
ground, (Figs 2 and 4).

[0025] The body 12 and the fulcrum mechanism 36, 42, 56 are preferably made of metal, such as steel, or any other suitable materials.

5 [0026] FIGS. 2, 3 and 4 show the operation of the self-loading wheelbarrow 10 of the present invention.

10 [0027] An operator holds the handles 16 by his hands and wheels the wheelbarrow 10 between a loading area and a dumping area. In this condition, as shown in FIG. 1, the wheels 14 engage the ground while the body 12 and the fulcrum leg members 36 are retracted and are not engaging the ground.

15 [0028] In order to shovel up a load from the loading area, an operator first wheels the wheelbarrow 10 towards a pile of material in the loading area. The operator then tilts the wheelbarrow 10 forwardly (Fig 2) by lifting up the two handles 16 so that the handles 16 are at an approximately 11 o'clock position and the wheels 14 are lifted off the ground, as shown in Fig 2. In this position, the blade portion 28 of the front loading sloping shovel end 24 of the body 12 is angled downwardly, and the sloping shovel end 24 can begin to sink into the pile of material to be loaded.

20 The operator then swings the handles further upward to approximately an 11 o'clock position (Fig 3). With his foot he then pushes the cross bar 54 generally downwards towards the front loading end 24. This pushes the two fulcrum leg members 36 forwards and downwards into the ground. The fulcrum leg members 36 advance forwards and downwards until the tapered ends 38 sink completely into the

ground and further sinking is restricted by the stop plates 40. The fulcrum leg members 36 are now in a ground-engaging position (Fig 3).

[0029] With the foot still pressing on the cross bar 54 and the fulcrum leg members 36 still engaging the ground and acting as fulcrums, the operator starts pulling the handles 16 backwards and downwards. This swings the body 12 downwards and at the same time levers it forwards so that the front loading end 24 advances further , deep into the pile of material, as shown in FIG. 3.

With the fulcrum members 36 still engaging the ground and acting as fulcrums, the operator continues to exert downward force to the handles 16. This causes the sloping shovel to advance further forwardly into the material due to leverage from the fulcrum leg members.

In order to start levering and shovelling up the load the operator then swings the handles back down towards himself. This forces the sloping shovel end of the body 15 to shovel up a load of material. This shovelling action is assisted by the action of the fulcrums leg members 36 , Because they are firmly anchored in the ground, the rearward swinging of the handles will tend to force the sloping shovel end forwardly into the material. This action is assisted by the springs which tend to want to swing the fulcrum leg members, rearwardly. However since the free ends of the fulcrum leg members are anchored in the ground, the levering effect forces the sloping shovel 20 further into the material, and assists in loading the material.

Consequently the springs tend to force the body forwardly and thus assist in shovelling up a larger load of material.

[0030] When the handles 16 are lowered to a position where the wheels 14 start to touch the ground, the operator begins to lift his foot off the cross bar 54. When the foot is lifted off the cross bar 54, the fulcrum mechanism 36, 42, 56 swings back to its retracted position under the influence of the biassing springs until the cross bar 54

5 hits the handles 16.

[0031] When the handles 16 are further lowered to an approximately horizontal position, as shown in FIG. 4, the load slides backwards from the front loading end 24 to the rear receptacle end 26 of the body 12 by means of gravity.

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[0032] This sliding of the load from the front loading end 24 to the rear receptacle end 26 of the body 12 can be facilitated by shaking the body 12.

[0033] The above loading steps are repeated to obtain a full load in the body 12.

15 Depending on the kind of material to be loaded, the wheelbarrow may be fully loaded after one shovelling operation.

[0034] Although it has been described that the fulcrum mechanism is spring-biassed to the retracted position by means of springs, it is appreciated that the fulcrum mechanism can be retained in the retracted position by other devices such as friction clips or counterweights.

[0035] With the fulcrum mechanism retained or biased in the retracted position, the wheelbarrow of the present invention can be used as a conventional wheelbarrow or a wheeled shovelling device. Wheeling of the loaded wheelbarrow requires much less effort than the conventional wheelbarrow, because the weight of the load is carried over the wheels. The weight is not carried on the arms of the operator, to any significant extent.

[0036] The present invention utilizes certain principles and/or concepts as are set forth in the claims appended to this specification. Those skilled in the arts will realize that these principles and/or concepts are capable of being utilized in a variety of embodiments which may differ from the present embodiment utilized for illustrative purposes herein. For this reason, the present invention is not to be construed as being limited solely to the illustrative embodiment, but should only be construed in view of the claims.

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